GCI Radar

Introduction by Cherub Log

GCI Radar was a very early ground installation, coming into service in the UK possibly 1937. GCI stood for Ground Control Interception, and as such was used by the RAF for vectoring in British fighter aircraft to approaching German attack aircraft. When the RAN established its Fleet Air Arm base at HMAS Albatross in the late 1940s, a Type GCI was installed near the intersection of the runways 21 and 26. It is believed that the system had a dual role of GCI and GCA, Ground Control Approach. This was one of five navigational aids to aircraft control at HMAS Albatross. The others, mentioned in other articles in this journal were the Type 277 Q 10 cm radar installed on nearby Nowra Hill, the FV5 VHF Direction finding equipment installed 1 Km south of the control tower, the AH6 HF DF installed 1 Km north of the contol tower and the YG beacon, installed on Nowra Hill. Thus the risk of losing an aircraft during night flying exercises was quite low.

GCI by E.C. “Ted” Strauss

As an “on loan Pom” in the early to mid fifties, I spent some time as the LREM at the GCI site at RANAS Nowra, and really enjoyed the experience being theonly Radio Mech on site. Lt Cdr Brasch was the Air Direction Officer at the time. Today he would be called SATCO. He appeared to have more faith in the GCI than he did in the more modern 277 installation on Nowra Hill. All three of us, Brasch, me and GCI, got along well together.

The GCI was an early Radar , made in about 1935 or 1936, with a rotating aerial and operating in the 200 Mcs band. Display was a PPI showing range and bearing, and an “A” display from which target height would be calculated. Power output was in the region of 100Kw peak, and the PRF would lie between 150 and 350 PPS. The antennas a wooden frame mounted on a wooden hut, all of which rotated. The frame was covered in chicken wire and mounted two horizontal rows of dipoles which were switched in such a manner as to result in three transmitted lobes, thus giving height cover from 4 to 30 degrees above horizontal. The aerial was fed by an open pair. In the Nowra installation, the range and bearing information was transmitted via a locally designed transmitter feeding a Yagi array to remote displays in the control tower.

The original system was an on-site console housing some of the electronics, and the PPI and “A” scan displays for the operator’s use. Target height calculation was by means of a chart with range and decimal fraction axes. From the “A” display the operator assessed the fraction of a second echo of a target with respect to the primary echo, and used this fraction and the range to read the altitude off the chart. I had the experience of operating the height plot on an occasion when due to sickness there was a shortage of Radar Plotters coupled with an important exercise. For the age of the system, the height plotting was remarkably accurate.

Cherub Log’s note:

“Ted” Strauss has provided good quality photocopies of the major circuits which together made up the Type GCI. These circuit diagrams, dated September 1947, are as follows:

Control Unit 181. GCI Multivibrator unit. Intensifier unit. Monitor unit.Transmitter unit. Switch unit type 38. Calibrator and phase splitter. Modulator unit.RF unit. Amplifier type A3175. IF unit. Aerial rotating gear. Turning gear Bloc diagram.

Some of the thermionic vale types used are as follows:

IF Amplifier, VR 91pentodes. “A” scan monitor VCR112. Modulator SP41 pentodes and VT127 tetrodes. Calibrator and phase splitter KTZ41 tetrodes. Multivibrator unit VR91 pentodes. RF preamplifier RL7 pentodes. HT DC supplier from two V1901 rectifiers. Transmitter two VT 98A triodes